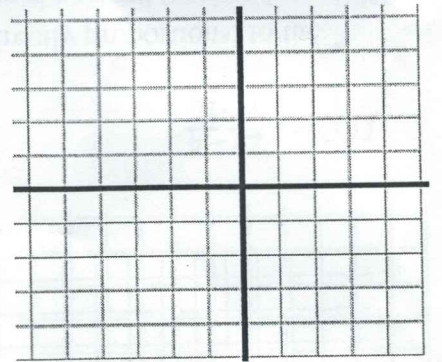


9. Describe each formula using the language of proportionality

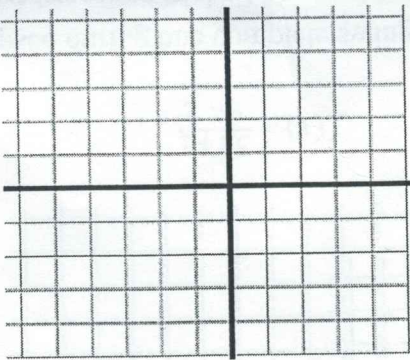
a.  $V = 12\pi r^2$  where  $V$  is volume and  $r$  is radius of a cylinder.

b.  $V = \frac{130}{P}$  where  $V$  is volume and  $P$  is pressure.

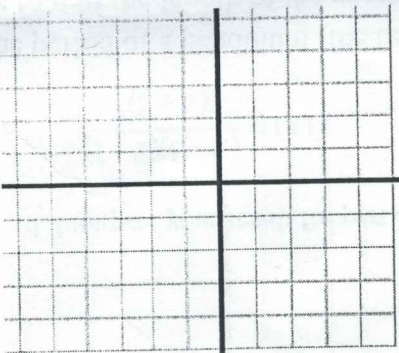
10. Sketch the graph of each function by finding  $x$ -intercepts, the  $y$ -intercept, and end behavior.



$$f(x) = (x-2)(x-1)(x+2)$$



$$f(x) = -(x-2)(x-1)(x+3)$$



$$f(x) = -x^3 + x^2 - 6x$$

11. The intensity of light from a point source is inversely proportional to the square of the distance from the light source.

a. If the intensity is 4 watts per square meter at a distance of 6 meters from the source, find the constant of proportionality,  $k$ , and write the formula for intensity,  $I$ , as a function of distance,  $d$ , from the source.

b. Find the intensity at a distance of 8 meters from the source.

c. If the distance from the source doubles, what is the effect on the intensity of the light? Answer in a clear sentence and show complete and persuasive mathematical work.

d. Find the inverse formula,  $d(I)$ , and compose the two functions to demonstrate that they are truly inverse functions.